

Model-Based Engineering Session

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Safety-Critical Software, facts

Safety-Critical Systems are becoming software

Today's cars usually contains more than 50 software systems

Application in all domain (aircraft, automotive, medical, ...)

Software size is growing

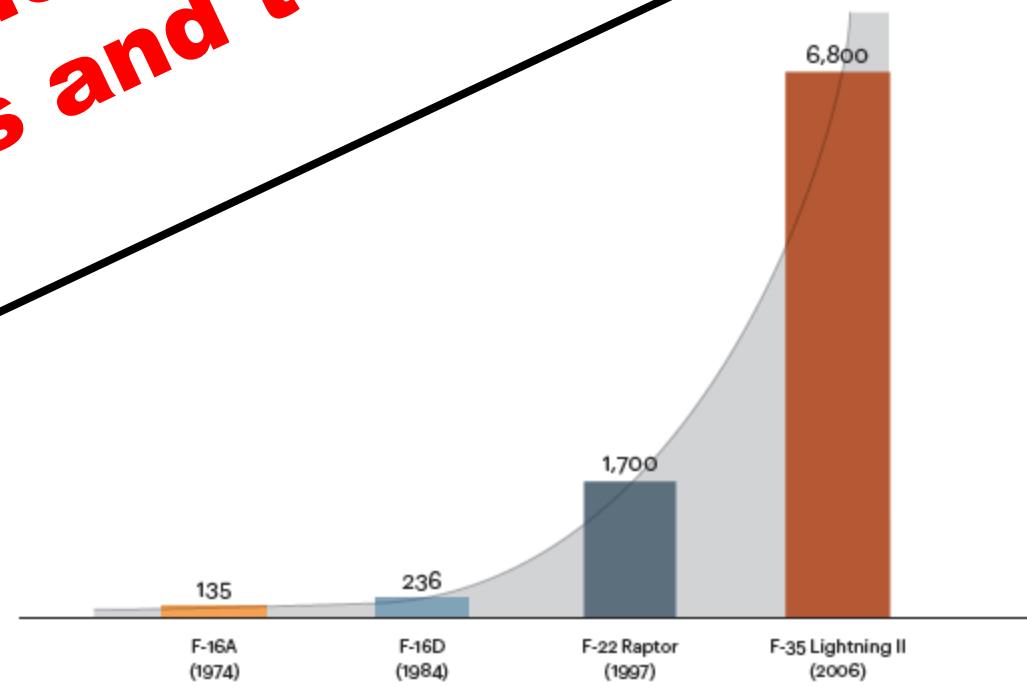
... but

Increased

Less

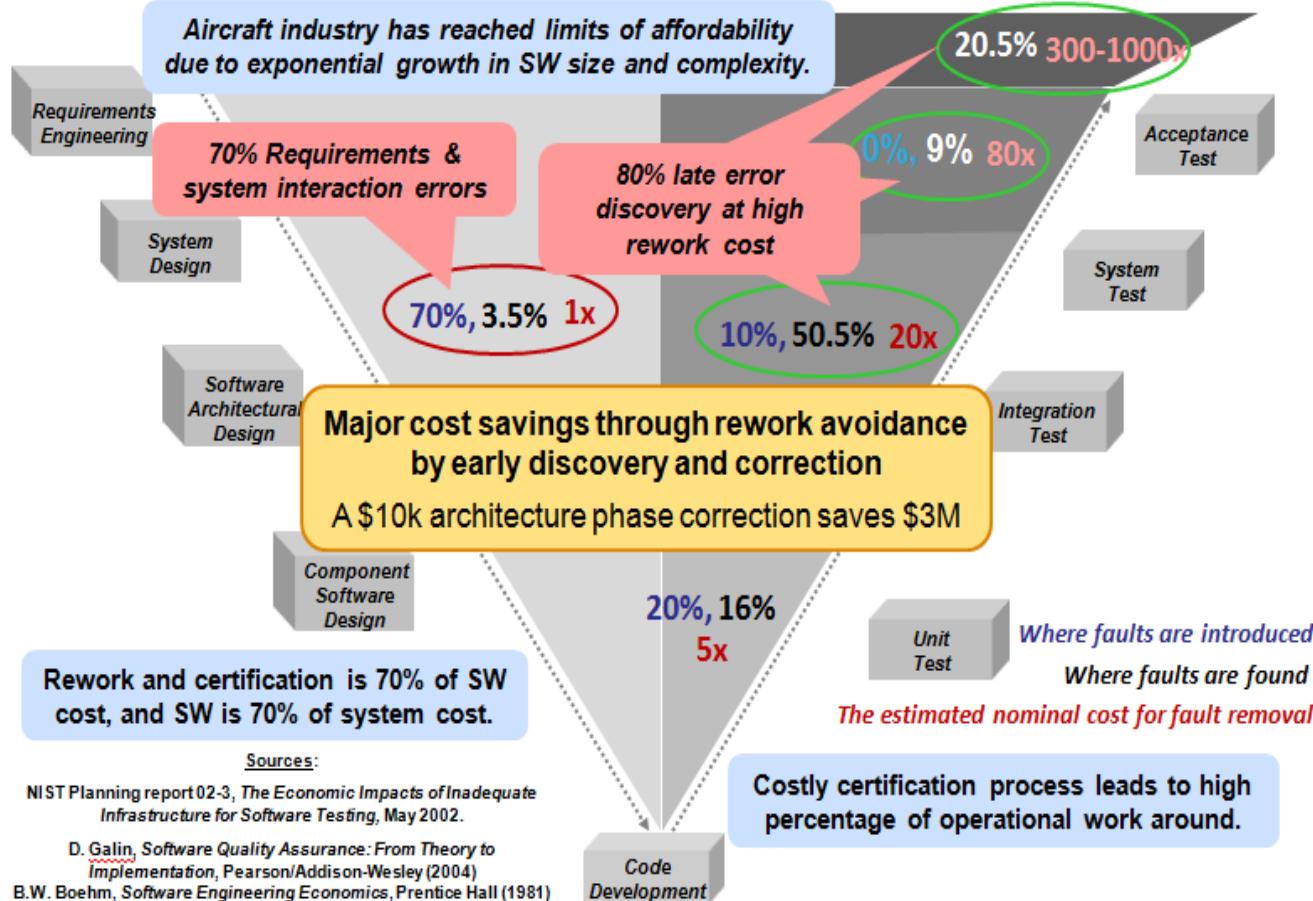
Less work

Need to find new development methods and tools



Understanding Actual Software Issues

High Fault Leakage Drives Major Increase in Rework Cost



The Model-Based Approach

Abstract System Representation

Hide and delegate implementation details to tools

Highlight Software or System important concerns

Separate domains of engineering

Functional models for representing control laws

Architecture models to validation components deployment

Automate the development process

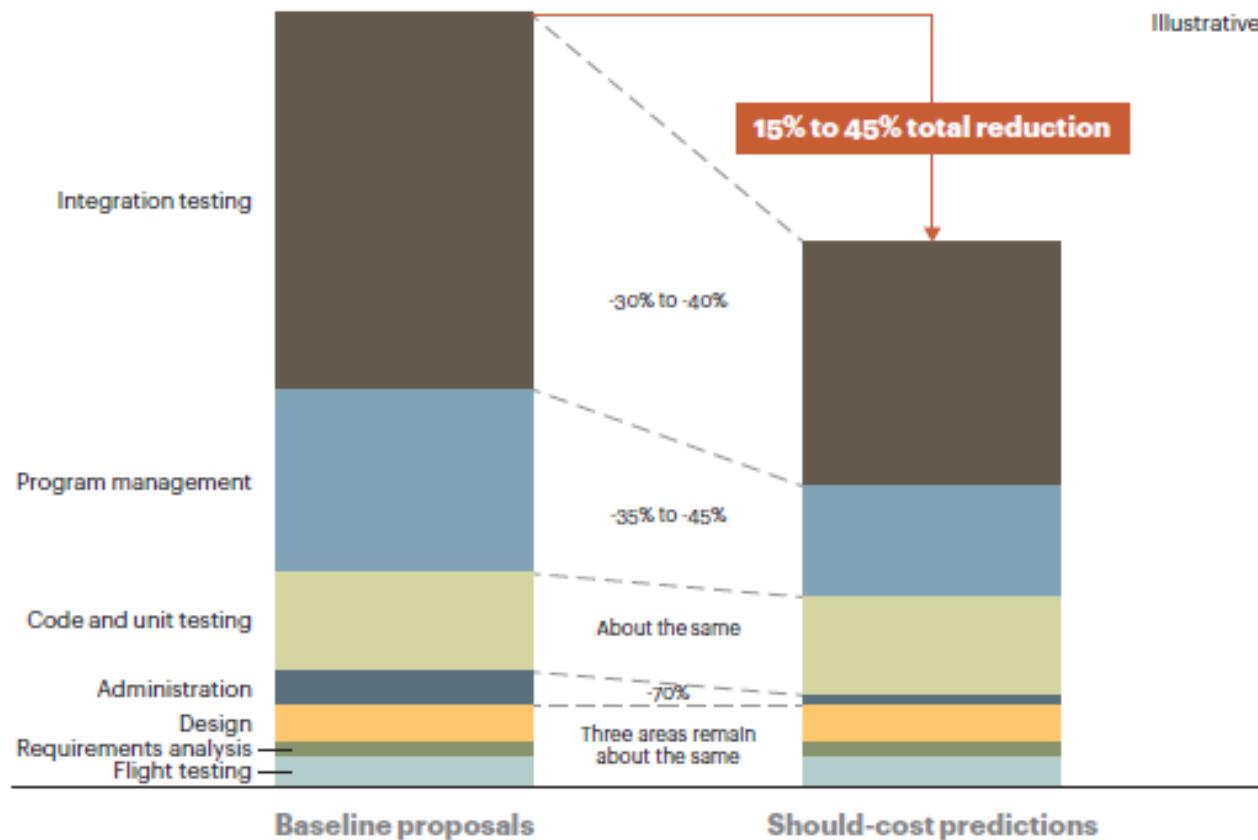
Avoid manual efforts (code production, system validation)

Support each development step (design, development, etc.)



Model-Based Cost Expected Benefits

Should-cost modeling identifies significant potential savings



Model-Based, other benefits

Management of Product Lines

Components variability

Reuse of existing certification/validation artifacts

Detect components integration issues

Before implementation efforts

Check system requirements enforcement before testing

Facilitate validation/verification/certification activities

Generation of documentation

Use of Model-Based Verification



Model-Based Engineering at HILT2014

- “AADL and Model-Based Engineering” - **Peter Feiler**
- “Resolute: An Assurance Case Language for Architecture Models” – **John Backes**
- **More to come after!**
- **5 papers (almost 50%!) have a focus on Model-Based Engineering**
- **Common objectives with the initial SIGAda conference**



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